



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

## CALCULUS.

---

152. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy, Defiance College, Defiance, Ohio.

Solve the linear differential equation

$$e^x \left[ \frac{dy}{dx} - y \log x \right] - a [\log x + 1] = 0.$$

153. Proposed by J. SCHEFFER, A. M., Hagerstown, Md.

Find the equation of the loxodromic curve on an oblate spheroid.

## MECHANICS.

---

142. Proposed by GEORGE R. DEAN, B. Sc., Professor of Mathematics, University of Missouri School of Mines and Metallurgy, Rolla, Mo.

In infinite mass of liquid is bounded by the plane  $zx$ , on which are small corrugations given by  $y = \phi(x)$ . The velocity of the liquid at an infinite distance from the plane is parallel to  $x$  and equal to  $V$ . Prove that the velocity potential is  $V_x + \frac{V}{\pi} \int_{-\infty}^{\infty} \frac{(x-\lambda)\phi(\lambda)d\lambda}{y^2 + (x-\lambda)^2}$ . [Basset's *Hydrodynamics*.]

143. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, Gloucestershire, England.

Beads are fastened at equal intervals on a string placed over a smooth fixed pulley. If the original position of the string is one of symmetry, find the velocity at any moment, the pressure on the pulley, and the velocity with which the string leaves the pulley.

## DIOPHANTINE ANALYSIS.

---

102. Proposed by F. L. SAWYER, Mitchel, Ontario, Canada.

Prove that the factors of the sum of the squares of two numbers prime to each other are themselves the sum of two squares.

103. Proposed by HARRY S. VANDIVER, Bala, Pa.

Find some solutions of  $x^3 + ay^3 = z^3$  (for  $x$ ,  $y$ , and  $z$ ) and show that there is an infinite number of solutions corresponding to each integral value of  $a$ .

## AVERAGE AND PROBABILITY.

---

127. Proposed by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics in The Temple College, Philadelphia, Pa.

What is the probable error of the volume of a rectangular parallelepiped whose edges measured by the repeated application of a unit of measure are found to be  $a$ ,  $b$ ,  $c$ , supposing that the probable error of a line so measured whose length is found to be  $l$  is  $r\sqrt{l}$ .

128. Proposed by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa.

Two small circles are drawn on the surface of a sphere so as to intersect; find average area of the spherical triangle formed by joining the poles and one of the intersections of the small circles with arcs of great circles.